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29989	7590	09/21/2005	EXAMINER	
HICKMAN PALERMO TRUONG & BECKER, LLP			THOMAS, SHANE M	
2055 GATEWAY PLACE			ART UNIT	
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SAN JOSE, CA 95110			2186	

DATE MAILED: 09/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/872,243

Applicant(s)

NGAI ET AL.

Examiner

Shane M. Thomas

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 August 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 2-8, 10-27 and 54-102 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 27 and 90 is/are allowed.
- 6) ☒ Claim(s) 2-4, 10-16, 19, 25, 26, 54-56, 60-68, 73-79, 82, 88, 89, 91-93 and 97-102 is/are rejected.
- 7) ☒ Claim(s) 5-8, 17, 18, 20-24, 57-59, 69-72, 80, 81, 83-87 and 94-96 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### **Continued Examination Under 37 CFR 1.114**

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/19/2005 has been entered. Claims 2-8, 10-27, and 54-102 remain pending.

All previous outstanding objections and rejections to the Applicant's disclosure and claims not contained in this Action have been respectfully withdrawn by the Examiner hereto.

### ***Response to Amendment***

As per Applicant's amendment filed 8/19/2005, the Examiner has cited the new prior art reference of Courts et al. to reject claims 2-4, 10-16, 19, 25, 26, 54-56, 60-68, 73-79, 82, 88, 89, 91-93, 97-102. Courts teaches a method for automatically adjusting segments within a storage space (log buffer 101).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 2-4,10-16,19,25,26,54-56,60-68,73-79,82,88,89,91-93,97-102, are rejected under 35 U.S.C. 102(b) as being anticipated by Courts et al. (U.S. Patent No. 5,636,360).

In order to make this Office action more coherent, the Examiner will follow the order of claim dependence of the independent claims instead of chronological claim order. Therefore, the rejection of claims 12 and 13 will follow the rejection of claim 2 since they are the next claims dependent upon on claim 2. Likewise, the rejection of claim 10 will follow the rejection of claim 54, since claim 10 is dependent upon claim 54.

As per claims 2 and 66, Courts teaches a storage space (log buffer 101 - figure 2) for storing undo information that removes changes that are being made to data a plurality of entities (transactions), wherein the application of the undo information returns the changed data to a state prior to when the changed were made (column 3, lines 50-67). The undo information for each transaction (entity) is stored in a segment (log entry) of the plurality of log entries (all initially the size of a single blocks - column 4, lines 1-12).

The usage of the storage space by the transactions is monitored (column 3, lines 65-67).

Each segment (log entry) of the plurality if log entries (initially the collection of single blocks of the log buffer 101) is pre-allocated for storing undo information (as the blocks 21-25

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are only used for undo information - column 4, lines 1-12) for transactions to which will write the undo information to the blocks.

Each transaction is assigned a segment (log entry) when it begins executing (column 4, lines 1-12).

The sizes of the segments (log entries) can be automatically adjusted by adding another block to the blocks already being used to store undo information for the currently executing transaction (column 4, lines 6-12). Additionally, the number of segments can be increased (i.e. another log entry is created when a new transaction begins executing since the log buffer 101 can contain log entries for multiple transactions simultaneously (column 4, lines 9-12).

As per claims 12 and 75, the step of determining whether a first segment of the plurality of segments is not storing undo information for the plurality of entities occurs when the present transaction has filled a currently block 21-25 and need to be allocated a second block. If another block can be allocated (i.e. the log buffer 101 is not full) another block is allocated to the log entry of the transaction (column 4, lines 1-12).

As per claims 13 and 76, the Examiner is considering a --first amount-- to be the amount of a block 21-25, which is allocated to a transaction when the transaction has filled its currently block with undo information (column 4, lines 1-12). The rejection follows the rejection for claim 12, supra with a whole block 21-25 being a --first amount--. The --first amount-- is determined it is not being used by another transaction before being allocated to the current transaction, as a transaction's undo information can span multiple blocks (column 4, lines 6-10); thus the step of determining is inherent as a log entry cannot span multiple blocks if a second block is not available for allocation.

As per claims 4 and 68, the rejection for lines 1-14 follows the rejection for claim 2. Regarding lines 15-18, the Examiner is considering --each period of time-- to be when a new transaction is to begin execution and thus a new log entry in the log buffer 101 is required. Thus a --series of periods of time-- is being considered to be the plurality of instances when a new transactions start. A time period before a new transaction is to start is a --first period of time-- and a time period when a new transaction is to start (and new log entry allocated according to column 4, lines 10-11) is a --second time period--. Therefore, the automatically adjusting the number of segments (log entries) in the log buffer 101 occurs between the usage between the period of time when a new transaction has not started and the period of time when a new transaction is to start.

As per claims 54 and 91, the rejection for lines 1-8 and 10-11 follows the rejection for claim 2, lines 1-6, 10-12, and 16-17, respectively. It can be seen that each segment (log entry) can be used as a circular buffer since the log entry blocks are reallocated for new transactions' undo information when the log buffer 101 gets flushed into the log partition 102 (abstract). Thus old log entries will get overwritten with new log entries after being flushed to the log partition.

As per claims 3 and 67, the maximum amount of storage space is the length of the log buffer 101 (column 4, lines 11-12).

As per claims 10 and 73, the Examiner is considering --first conditions-- to be if the log buffer 101 is *not* full and a --first amount of storage space-- (i.e. an unallocated block 21-25) exists to be allocated to a new transaction since the log buffer 101 can comprise log entries from multiple transactions simultaneously (column 4, lines 1-12). Thus, if the first conditions are satisfied (buffer not full), the next available block 21-25 (first amount of storage space) is

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allocated to a new segment (log entry) of the plurality of segments (log entries currently comprised in the log buffer 101).

As per claims 11 and 74, the Examiner is considering --first conditions-- to be if the log buffer 101 is full and needs to be flushed to the log partition 102 (abstract). In other words, all of the segments in the log buffer are concurrently storing undo information for transactions. Thus if first conditions are met, the log entries of the log buffer 101 are flushed to the log partition and once this occurs a new segment (log entry) can then be formed in the log buffer 101. Refer to the abstract.

As per claims 14 and 77, the size of a first segment (log entry) can be expanded automatically by allocating an unused block 21-25 of the log buffer 101 to the log entry, as log entries can comprise multiple blocks (column 4, lines 1-12).

As per claims 15 and 78, the rejection follows the rejection of claim 14, wherein an inherent determination is made when the transaction is writing undo data to the latest block 21-25 of its segment (log entry). If sufficient storage is not already allocated to the first segment (i.e. another block 21-25 is needed to store more undo information from the transaction), the size of the log entry is increased (thereby comprising multiple blocks) by adding a block 21-25. Refer to column 4, lines 1-12.

As per claims 16 and 79, the new undo block 21-25 that is appended to the log entry of a transaction whose previous undo block 21-25 has been filled with undo information is being considered by the Examiner to be --sufficient-- for storing undo information included in the request for another undo block from the requesting transaction.

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As per claims 19 and 82, since the log entries of Courts can comprises multiple blocks 21-25 (column 4, lines 1-12), a determination whether an additional block (additional amount of storage space) that is not currently allocated to another log entry is available is inherent. Such inherency allows for the log entries to comprise multiple blocks (the multiple blocks must be checked to make sure they are unallocated before being written to). If no unallocated blocks exist, the log buffer 101 is full and must be flushed to the log partition 102 (abstract).

As per claims 25 and 88, the additional amount (a block 21-25) is an extent of contiguous storage space as shown in figure 2.

As per claims 26 and 89, allocating unused amounts of the storage space of log buffer 101 to the plurality of segments (log entries) in response to receiving more undo information is taught in column 4, lines 1-12 (log entries can comprise multiple blocks). De-allocating of storage space occurs periodically (such as when the log entries of the log buffer 101 get flushed to the log partition 102), thereby allowing for other transactions to utilize the log buffer for allocating log entries.

As per claims 55 and 92, the step of automatically adjusting is performed when a new (second) transaction is allocated a block 21-25 for its log entry. Multiple segments (log entries) can be comprised in the log buffer 101 (column 4, lines 1-12).

As per claims 56 and 93, the step of automatically adjusting is performed when a first transaction requires another block 21-25 in which to store additional undo information. Segments can comprise multiple blocks 21-25 (column 4, lines 1-12).



As per claims 60 and 97, an entity (transaction) is assigned to a segment (log entry) based on the usage of the plurality of log entries in that if a block 21-25 is unallocated (not used) of the log buffer 101, a transaction may allocate the block in order to store the undo information corresponding to that transaction. Refer to column 4, lines 1-12).

As per claims 61 and 98, the Examiner is considering statistical information to be the amount of space left in the log buffer 101, such that it can be determined when the usage of the segments (log entries) reaches a maximum limit for the size of the log buffer 101. When this limit is reached, the log buffer 101 is flushed to the log partition 102 (abstract).

As per claims 62 and 99, it is inherent that information associated with the usage of the plurality of segments (entities) is stored. Such inherency can be seen with reference to figure 8, step 81. The amount of space remaining in the log buffer 101 (i.e. *information* associated with how much of the log buffer is being used) is required to be stored (in a register most likely) in order for it to be compared with the LENGTH variable of step 81.

As per claim 63 and 100, the Examiner is considering the information (amount of remaining log buffer space) to be stored in an --array- of bits. For example, when the log buffer is empty (contains no undo information), more than one block 21-25 is unallocated and thus more than 1 bit will be needed to store the value of the remaining log buffer space; an *array* of bits is inherently needed to store the value of the log buffer space to which the LENGTH variable is compared in step 81.

As per claims 64 and 101, the storing of the information associated with the usage of the log buffer 101 must be performed periodically as evidenced by step 81 of figure 1 in order to

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know when to branch to step 82. In other words, the amount of remaining space in the log buffer must be constantly updated in order to determine when the LENGTH variable exceeds it.

As per claims 65 and 102, the log buffer 101 may comprise multiple segments (log entries) (column 4, lines 1-12). The step of determining determines whether or not an unallocated block exists in the buffer (determines usage of the segments) to which a new transaction (entity) maybe allocated. In other words if an unallocated log entry (i.e. initially a single block) exists, the system will allocate that log entry for the new transaction since the usage of that log entry is non-existent (i.e. the segment is not currently being used by another transaction).

#### *Allowable Subject Matter*

Claims 27 and 90 are allowable over the prior art of record, as mentioned in the previous Office action, dated 2 February 2004. The prior art of record does not specifically teach nor suggest every limitation presented in claim 27. Claim 90 is allowable as being dependent upon claim 27.

Claims 5-8,17,18,20-24,57-59,69-72,80,81,83-87,94-96, are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

As per claim 5, the prior art of record does not specifically teach or suggest alone or in combination determining whether a usage [of the plurality of segments] has decreased over a

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predetermined period of time based in part on the usage in at least one of the periods of time and, as a result, shirking the sum of the sizes of the plurality of segments.

As per claim 7 the prior art of record does not specifically teach or suggest alone or in combination the limitations of claim 7. Specifically, Courts does not teach, upon determining a decrease in usage over a period of time, de-allocating a first amount of storage space from a first segment if the first segment is not using the first amount of storage space.

As per claim 17, the prior art of record does not specifically nor suggest teach allocating an additional amount of storage space to the first segment wherein the amount of storage space is based on the storage already allocated to the first segment. Ganesh simply allocates another [same sized] undo block when a present block is full of undo records. Refer to column 7, lines 15-23.

As per claim 18, the prior art of record does not specifically nor suggest allocating an additional amount of storage space to the first segment wherein the amount of storage space is selected from a plurality of predetermined amounts.

As per claim 20, the prior art of record does not specifically teach nor suggest determining whether the additional amount is currently allocated to a second segment and if it is not being used then allocating it to the first segment. In relation to the Ganesh reference, Ganesh does not teach de-allocating a portion of the storage space (undo blocks) from one transaction to another since all of the undo blocks associated with a given transaction are being used by that transaction.

As per claim 21, the prior art of record does not specifically teach nor suggest monitoring usage in each period of time of an amount of the undo information stored in each period of time.

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As per claim 22, the prior art of record does not specifically teach nor suggest monitoring a number of entities started in each period of time.

As per claim 23, the prior art of record does not specifically teach nor suggest monitoring a maximum number of entities executing concurrently in each period of time.

As per claim 24, the prior art of record does not specifically teach nor suggest monitoring a maximum duration in each period of time among durations of queries termination during the period of time, wherein the queries use at least some of the undo information stored in the storage space.

As per claim 57, the prior art of record does not specifically teach nor suggest de-allocating storage space from one segment when that segment includes other storage space that is being used by one or more transactions (entities). Specifically, Courts does not teach such a de-allocation for the log entries of the log buffer 101.

Claims 6,8,58,59,69-72,80,81,83-87, and 94-96 are objected to as being dependent on objected to claims 8, 17, 18, 20-24, and 58, respectively.

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***Response to Arguments***

Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground of rejection.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shane M. Thomas whose telephone number is (571) 272-4188. The examiner can normally be reached on M-F 8:30 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt M. Kim can be reached on (571) 272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Shane M. Thomas

HONG CHONG KIM  
PRIMARY EXAMINER

